a protrusion extending from the first wall of the exhaust channel into the exhaust channel so as to reduce the transverse width of the exhaust channel adjacent the protrusion; and

a magnet system having north and south magnetic poles positioned adjacent the protrusion.

3. (amended) A plasma chamber comprising:

a vacuum chamber enclosure enclosing a chamber interior;

an exhaust aperture through which gas can be exhausted from the chamber interior;

an exhaust channel extending between the chamber interior and the exhaust aperture so as to provide a path for gas flow from the chamber interior to the exhaust aperture;

a magnet system positioned adjacent the exhaust channel; and

a chuck for holding a substrate at a substrate position within the chamber interior;

wherein the magnet system is positioned far enough from the substrate position so that the magnet system produces a magnetic field that declines from at least 100 gauss at one position in the exhaust channel to no greater than 5 gauss at the substrate position.

7. (twice amended) A plasma chamber comprising:

a vacuum chamber enclosure enclosing a chamber interior;

an exhaust aperture through which gas can be exhausted from the chamber interior;

an exhaust channel extending between the chamber interior and the exhaust aperture so as to provide a path for gas flow from the chamber interior to the exhaust aperture;

a deflector positioned within the exhaust channel so as to transversely deflect a substantial portion of said gas flow through the exhaust channel; and

a magnet system having north and south magnetic poles positioned adjacent the deflector.

9. (twice amended) A plasma chamber according to claim 7, wherein:

the north and south magnetic poles are spaced apart along said gas flow path of the exhaust channel.

10. (twice amended) A plasma chamber according to claim 7, wherein the magnet system produces a magnetic field strong enough to block plasma from extending from the chamber interior through the exhaust channel beyond the protrusion.

11. (amended) A plasma chamber according to claim 7, further comprising:

a chuck for holding a substrate at a substrate position within the chamber interior;

wherein the magnet system is positioned far enough from the substrate position so that the magnet system does not produce a magnetic field greater than 5 gauss at the substrate position.

26. (twice amended) A method of preventing plasma within a plasma chamber from extending completely through the exhaust channel of the chamber, comprising the steps of:

providing a vacuum chamber enclosure that encloses a chamber interior;

admitting a gas into the chamber interior;

providing an exhaust channel extending between the chamber interior and an exhaust aperture so as to provide a path for gas flow from the chamber interior to the exhaust aperture;

positioning a deflector within the exhaust channel so as to transversely deflect a substantial portion of said gas flow through the exhaust channel; and

creating a magnet field within the exhaust channel.

Insert new claims 32–46 as follows:

32. A plasma chamber according to claim 1, wherein the magnet system is positioned with its north and south magnetic poles within the protrusion.

33. A plasma chamber according to claim 3, wherein the magnet system produces a magnetic field of at least 100 gauss.

34. A plasma chamber according to claim 7, wherein the magnet system produces a magnetic field strong enough to block plasma from extending from the chamber interior to the exhaust aperture.

35 A plasma chamber according to claim 7, wherein the magnet system is positioned with its north and south magnetic poles within the protrusion.

36. A plasma chamber according to claim 11, wherein the magnet system produces a magnetic field of at least 100 gauss

37. A plasma chamber comprising:

a vacuum chamber enclosure enclosing a chamber interior;

an exhaust aperture through which gas can be exhausted from the chamber interior;

first and second tubular walls positioned coaxially so as to form therebetween an annular exhaust channel extending between the chamber interior and the exhaust aperture;

a first protrusion extending from the first wall toward the second wall;

a second protrusion extending from the second wall toward the first wall; and

a magnet system having north and south magnetic poles, wherein the magnet system is positioned so that the north and south magnetic poles are within the first protrusion.

38. A plasma chamber according to claim 37, wherein the north and south magnetic poles face the second wall and are spaced apart axially.

39. A method of preventing plasma within a plasma chamber from extending completely through the exhaust channel of the chamber, comprising the steps of:

providing a vacuum chamber enclosure that encloses a chamber interior;

admitting a gas into the chamber interior;

providing an exhaust channel through which said gas can flow from the chamber interior to the exhaust aperture, wherein the exhaust channel includes at least a first wall that extends between the chamber interior and an exhaust aperture;

providing a first protrusion that extends from the first wall of the exhaust channel into the exhaust channel so as to reduce the transverse width of the exhaust channel adjacent the first protrusion; and

creating a magnet field within the exhaust channel.

40. A method according to claim 39, further comprising the step of:

holding a substrate at a substrate position within the chamber interior;

wherein the creating step comprises creating said magnetic field with a strength that diminishes

sufficiently from the exhaust channel to the substrate position so that said magnetic field is at least 100 gauss at one position in the exhaust channel and is no greater than 5 gauss at the substrate position.

41. A method according to claim 39, wherein the step of creating a magnetic field further comprises the steps of:

providing a magnetic system having north and south magnetic poles; and

positioning the magnet system so that the north and south magnetic poles are within the first protrusion.

42. A method according to claim 41, wherein positioning step further comprises positioning the magnet system so that the north and south magnetic poles are spaced apart axially.

43. A method according to claim 39, wherein:

in the step of providing an exhaust channel, the exhaust channel further includes a second wall that extends between the chamber interior and the exhaust aperture;

the step of providing a first protrusion further comprises orienting the first protrusion so as to extend from the first wall toward the second wall; and

the method further comprises the step of providing a second protrusion that extends from the second wall toward the first wall.

44. A method according to claim 43, wherein the step of creating a magnetic field further comprises the steps of:

providing a magnetic system having north and south magnetic poles; and

positioning the magnet system so that the north and south magnetic poles are within the first protrusion.

45. A method of preventing plasma within a plasma chamber from extending completely through the exhaust channel of the chamber, comprising the steps of:

providing a vacuum chamber enclosure that encloses a chamber interior;

holding a substrate at a substrate position within the chamber interior;

admitting a gas into the chamber interior;

providing an exhaust channel through which said gas can flow from the chamber interior to the exhaust aperture; and

creating a magnet field having a strength of at least 100 gauss at one position in the exhaust channel and having a strength no greater than 5 gauss at the substrate position.

46. A method of preventing plasma within a plasma chamber from extending completely through the exhaust channel of the chamber, comprising the steps of:

providing a vacuum chamber enclosure that encloses a chamber interior;

holding a substrate at a substrate position within the chamber interior;

admitting a gas into the chamber interior;

providing an exhaust channel through which said gas can flow from the chamber interior to the exhaust aperture; and

creating a magnet field having a strength at one position in the exhaust channel that is great enough to block plasma from extending from the chamber interior to the exhaust aperture and having a strength no greater than 5 gauss at the substrate position.